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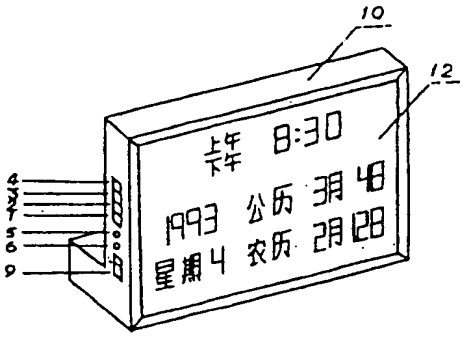
[54]实用新型名称 电脑公农历对照日历时钟显示屏

[57]摘要

本实用新型提供一种电脑控制的包含通常日历及时钟全部功能的公农历对照、自动整点汉语报时，并且有任意设定开关时间输出控制功能的日历时钟显示屏，它由外壳、电气线路组成，外壳前方装有显示屏，外壳侧面装有按钮以及转换开关，在外壳后方具有外接电器插座和蓄电池开关，电气线路装在外壳内部。本时钟显示屏具有日历及时钟全部功能，使用调整方便，特别是具有公历、农历同时显示，启动后能自动对照运行不需任何人工调整。



权 利 要 求 书

1、一种数字显示电脑控制的公农历对照日历时钟显示屏，由外壳10、电气线路11组成，其征在于：在外壳10的前方装有显示屏12，在外壳10的侧面装有数据按钮1、2，功能按钮3、4，执行按钮5 和复位按钮6，以及转换开关9，在外壳10的后部具有外接电器插座7 和蓄电池开关8和电源13，电气线路11装在外壳10的内部。

2、按权利要求1中所述的显示屏，其特征在于：所述的电路11由数据计算处理系统Ⅰ、数据传送显示系统Ⅱ、稳压电源Ⅲ、语言报时及外接电器接口系统Ⅳ组成。所述的数据计算处理系统Ⅰ由单片微型计算机80C31为主体，配有程序存储器27C64、数据存储器27C64、 接口电路82C55、8线译码器74HC138、8D锁存三态输出电路74HC373并经接口电路82C55与拨码开关1、2、3、4相联， 微型计算机经数据传送显示系统Ⅱ的译码驱动电路使数字在显示屏12上显示，微型计算机80C31的P_0口8位输出接到8D 锁存三态输出电路74HC373 的输入端， 并接至程序存储器27C64 和接和接口电路82C55 的数据端， 微型计算机的输出与译码器74HC138及8D锁存三态输出电路74HC373相联。

3、按权利要求2中所述的显示屏，其特征在于：所述的数据计算处理系统Ⅰ中的数据存储器27C64中固化有公农历对照表及计算公式。

4、按权利要求2中所述的显示屏，其特征在于：所述的语言报时及外接电器接口系统Ⅳ是由集成电路块CD4069、CD4013和CD4060组成的外接电器接口电路和由集成电路块CD4081、74HC74、CD4098组成的语音报时电路所组成。

电脑公农历对照日历时钟显示屏

本实用新型涉及一种能同时自动显示公农历日期及时间的数字显示计时装置，特别是电脑公农历对照日历时钟显示屏。

目前市售的显示装置有的只能显示公历和星期，不能显示农历，有的使用过程中还需根据大小月之不同进行调整，因此给使用带来不便。

本实用新型提供一种包含了通常日历及时钟全部功能的装置，加电后，当日期（年、月、日）及时间通过拨码开关置入数据后，启动后该显示屏可以公农历日期自动对照运行，不再需要任何人工调整。

本实用新型由外壳10、电气线路11组成，在外壳10的前方装有显示屏12，在外壳10的侧面装有数据控制按钮1、2，功能按钮3、4，执行按钮5和复位按钮6，以及转换开关9，在外壳的后方具有外接电器插座7和蓄电池开关8和电源线13，电气线路11装在外壳10的内部；该电气线路11由数据计算处理系统Ⅰ、数据传送显示系统Ⅱ、稳压电源Ⅲ和语言报时及外接电器接口系统Ⅳ组成；数据计算处理系统Ⅰ由单片微型计算机80C31为主体，配有程序存储器27C64 和数据存储器 27C64 及接口电路82C55，8线译码器74HC138、8D锁存三态输出电路74HC373组成，并经接口电路82C55与拨码开关1、2、3、4相联，微型计算机80C31经数据传送显示系统Ⅱ中的译码驱动电路使数字在显示屏12上显示，微型计算机80C31的P_0口8位输出接至8D锁存三态输出电路74HC373的输入端，并接至程序存储器27C64和可编程序的并行输入接口82C55的8位数据端，微型计算机80C31的输出与译码器74HC138及8D锁存三态输出电路 74HC373相联；在数据计算系统Ⅰ中的数据存储器27C64 中固化有公农合历对照表及计算公式；语音报时及外接电器接口系统Ⅳ是由集成电路块CD4069、CD4013和 CD4060 组成的外接电器接口电路和由集成电路块 CD4081 、74HC74、CD4098组成的语音报时电路所组成。

下面以实施例加以说明：

图1为本实用新型的外形图；

图2为图1中的K向视图；

图3为本实用新型的电气图。

如图1所示，在外壳10的前方的显示屏12上，显示有1993、公历3月4日、星期4、农历2月12日和上午、下午、8:30等字样，在其侧面有按钮1至6和转换开关9，该转换开关9仅在1999年至2000年转换时，拨动一次即可，如图2，在外壳10的后面装有外接电器插座7 用来控制开关时间和蓄电池开关8，拨向左为开启，此时有交流电时为充电，无交流电时为由蓄电池供电，在外壳10上还装有电源线13。如图3，在数据计算处理系统Ⅰ中，由单片微型计算机80C31为主体，配有程序存储器27C64、数据存储器27C64及接口电路82C55和8线译码器74HC138、8D锁存三态输出电路74HC373，数据存储器中存有计算程序及公农历对照表，当计算机计时到24小时后，进行日期归算处理，并按对照表给出当日的公农历日期数。计算机还将计算结果通过数据传送显示系统Ⅱ中的译码驱动电路，使数字在显示屏12的数码管显示出来。上电后通过拨码开关1至4 置入相关数据及命令，启动后该显示屏12将自动运行，由稳压电源Ⅲ向整个系统供给直流电。

本实用新型的电气部分之间的连线如图3所示，工作原理如下：微型计算机系统内的数据存储器27C64 中固化有公农合历对照表及计算公式，当系统上电后，部分Ⅳ中振荡器产生的脉冲信号进入微型计算机80C31作为输入信号及秒脉冲信号，微型计算机80C31的P_0口8 位输出接至8D锁存三态输出电路74HC373的输入端，同时接至程序存储器27C64和可编程的并行输入--输出接口82C55的8位数据端。微型计算机80C31 输出连接三线--八线译码器74HC138及8D锁存三态输出电路74HC373。可编程序并行输入--输出接口电路82C55的各输出(入)端均通过470KΩ电阻接至Ⅱ的电源正极，它的P_A口低四位(P_{A8} - P_{A0}) 与锁存译码驱动器CD4511的D、C、B、A端相连，高四位(P_{A7}-P_{A4})与锁存四线-- 十六线译码器CD4514的D、C、B、A端相连。各锁存译码驱动器分别驱动十七个发光数码管以在显示屏12上显示，锁存四线--十六线译码器CD4514的各输出端分别控制相关的功率放大器，由拨码开关按钮1、2、3、4输入数据后，计算机将根据拨码输入的数据值选出适当的指令进行运算，给出公农历的年、月、日、时、分和星期的信息，通过译码电路在显示屏12上控制各相应的数码管，将数值显示出来 系统Ⅰ中微型计算机的P_1口低五位(P_{14}--P_{10})用于输出启动公农历时钟显示屏12，发出语音控制和整点报时等指令。其动作过程为：CD4060电路接晶振(32768HZ)经过多次分

频后经由CD4013得到秒信号，再通过CD4069电路反相后，从CD4060的第5端、第7端按80C31的14、15端，从CD4069的第2、3端、第8端接 80C31的9、12端，上述三块电路构成秒信号发生及时钟控制，与80C31相勾通，使时钟及日期正常运行(图３右下角)CD4098的第11端与80C31的第5 端相连，整点时通过80C31触发CD4098，使其第9 端通过晶体管控制语音报时芯片用汉语报时。

CD4081的第8端与80C31的第3端相连，74HC74的第4端及第10端分别与80C314的第2、第4端相连构成外接电器控制电路，用户可从四位拨码开关1、2、3、4编程经80C31、CD4081及74HC74相互连接，由74HC74 的第9端输出，通过可控硅在用户指定的时间开启及断开外接电器， 完成外接电器控制功能。

调试步骤如下：如图１、图２。

１、直观检查无误后，接交流电源及电池备用电源(开关标号8)。

２、第一次上电或有其它需要时进行下述调试工作(正常运行时不必进行)。

调试工作主要操作机器上的拨码开关，此开关由四位数字及2×4个按钮(每位数字含二个按钮，一加一减)组成，其中按钮1、2为数据按钮，3、4为功能按钮，5为置入钮，6为复位钮。

功能按钮3、4定义如下:

按钮3	按钮4	功能
0	0	置定完公历年、月、日后能自动寻找对应的农历月、日及星期
0	1	可用数据按钮置时钟分的数值
0	2	可用数据按钮置时钟时的数值
0	3	可用数据按钮置公历日
0	4	可用数据按钮置公历月
0	5	可用数据按钮置公历年
0	6	可用数据按钮置整点报时的分
0	7	可用数据按钮置整点报时的时
0	8	可用数据按钮置控制外接电器开启的分值

0	9	可用数据按钮置控制外接电器开启的时值
1	0	可用数据按钮置控制外接电器关断的分值
1	1	可用数据按钮置控制外接电器关断的时值
1	2	取消控制外接电器功能
1	3	取消整点报时功能
1	4	可使日历向前进一日
1	5	整点报时向前进一个小时
		按钮6为复位钮

操作时，每次置1、2、3、4按钮后，都必须操作按钮5，此时相应数码管即显示置设数字。

调试设置举例:

1、设定时间信息：例如设定时间为1993年5月1日下午3时(即15时)35分，操作步骤及各钮置入数据如下:

	按钮1	2	3	4	
操作1:	3	5	0	1	将1、2、3、4钮拨至3、5、1、0后按下按钮5，将数据置入
2:	1	5	0	2	将1、2、3、4钮拨至1、5、0、2后按下按钮5，将数据置入
3:	0	1	0	3	将1、2、3、4钮拨至0、1、0、3后按下按钮5，将数据置入
4:	0	5	0	4	将1、2、3、4钮拨至0、5、0、4后按下按钮5，将数据置入
5:	9	3	0	5	将1、2、3、4钮拨至9、3、0、5后按下按钮5，将数据置入
6:			0	0	将1、2、3、4钮拨至 0、0后按下按钮5，将数据置入

第六步操作后，农历月、日及星期会自动跟踪对应显示，即农历闰三月初十、星期六。

2、整点报时调试：将3、4钮拨至1、5后连续按动按钮5，直至报出上一个小时数为止，以后即能自动报出正确整点数。

显示屏上除1至6按钮外，带有电源线13，电器插座7 以及蓄电池开关8，当该开关8拨向左方时，有交流电时可给电池充电，无交流电时，由电池供电，可保持时钟运行，但无显示。来市电后显示恢复正常。开关9仅在1999年至20000年时拨动一次，使显示的年份从二十世纪改为二十一世纪。

综上所述本实用新型与现有电脑日历钟或显示屏比较，其优点为：

1. 具有与公历、星期相对应的自动农历显示功能，而现有电脑日历钟或显示屏没有该农历显示功能；

2. 公农历大、小月、闰月及星期均能自动显示，无须人工调整，使用方便，现有电脑日历钟或显示屏一般在大小月时需人工调整，特别是在四年一次的闰月则必须人工调整；

3. 具有语音报时功能，而一般电脑日历钟则无此功能；

4. 市电停电后显示屏继续工作，来电时仍能自动显示当时相应的时间和日期，而一般用市电的电脑日历钟或显示屏则不能。

因此，本实用新型使用方便、功能齐全，所采用的电子器件均为市场上可购到的，成本较便宜。

说 明 书 附 图

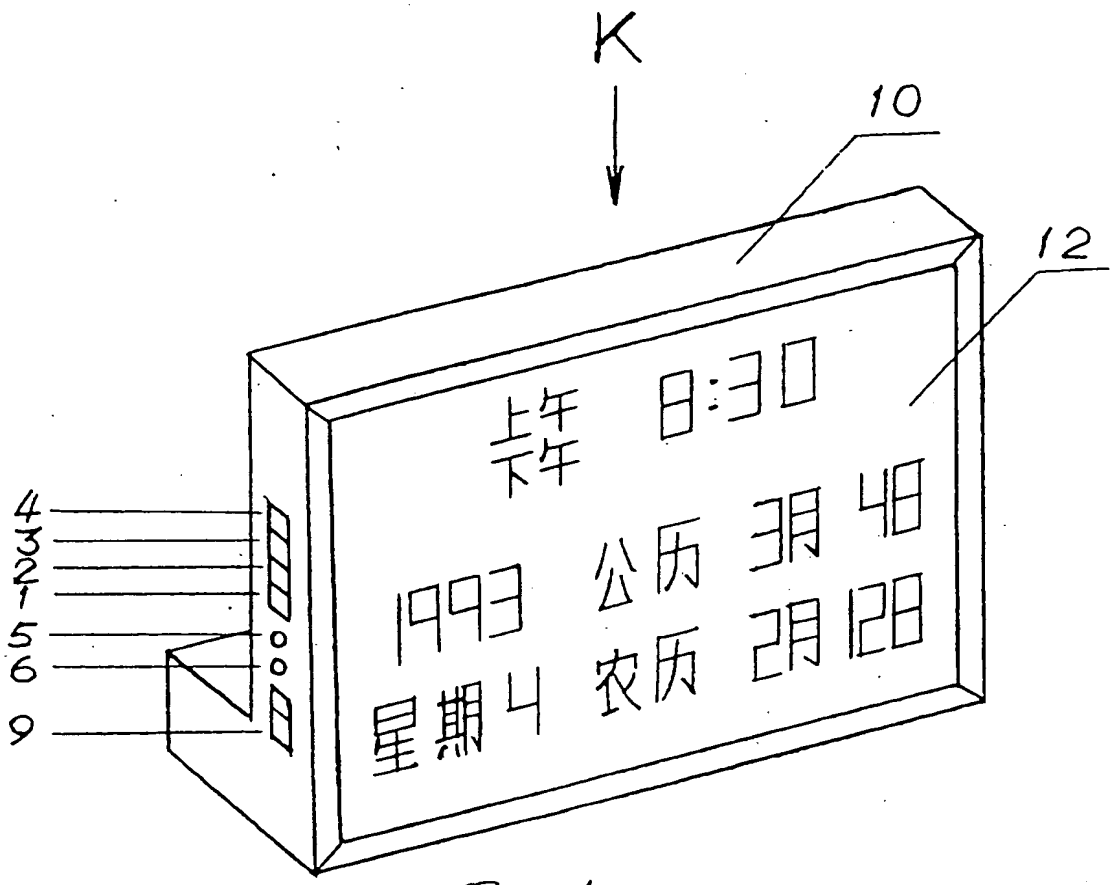


图 1

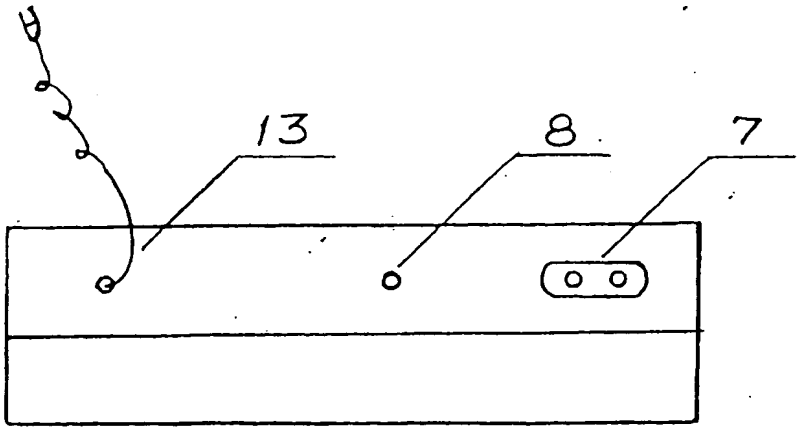


图 2

1004.
87.1

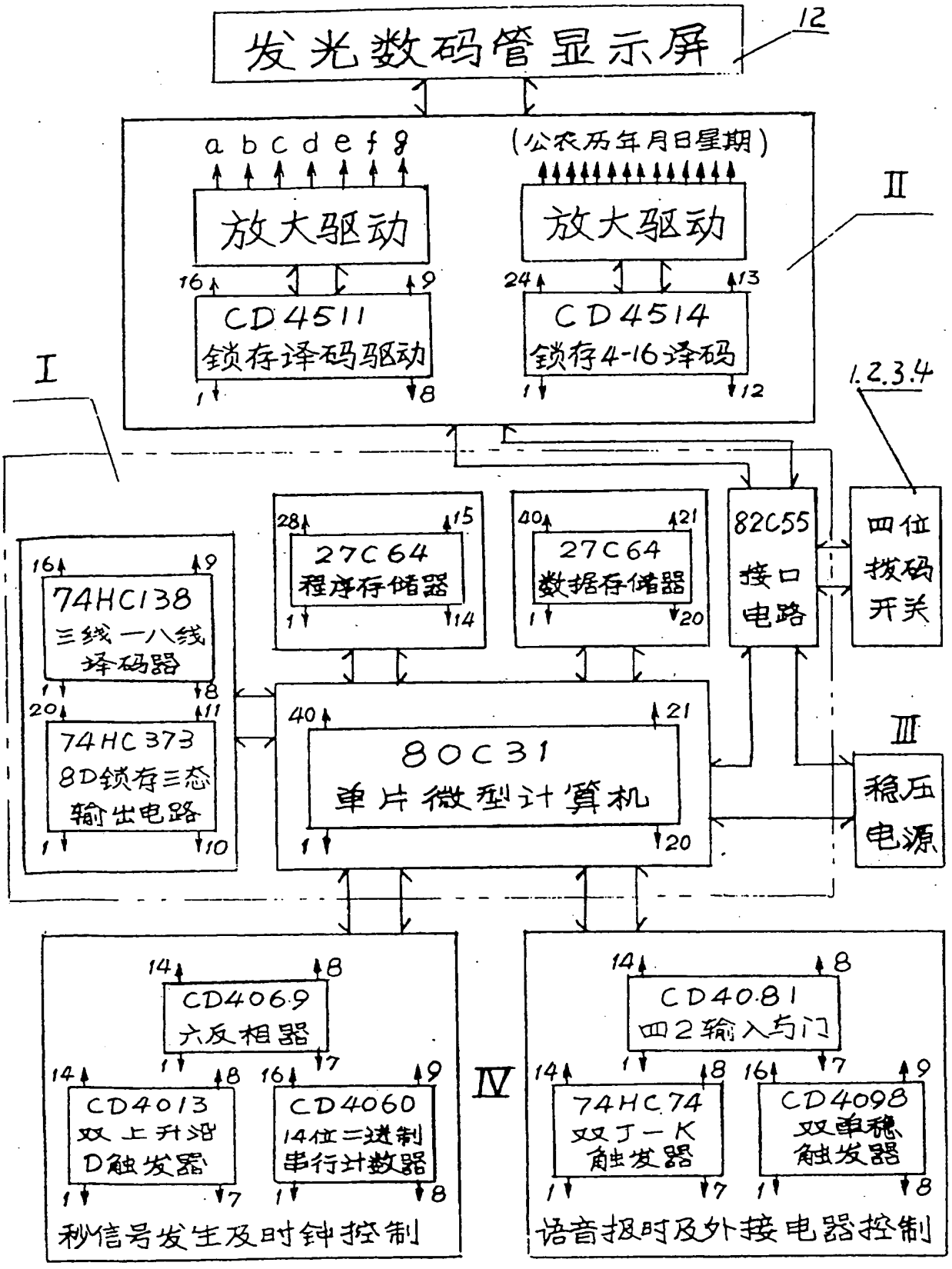

发光数码管显示屏
12
a b c d e f g
(公农历年月日星期)
放大驱动
放大驱动
Ⅱ
16
9
24
13
CD4511
锁存译码驱动
CD4514
锁存4-16译码
1
8
1
12
Ⅰ
1.2.3.4
28
15
27C64
程序存储器
40
21
27C64
数据存储器
82C55
接口
电路
四位
拨码
开关
1
14
1
20
16
9
74HC138
三线一八线
译码器
20
11
74HC373
8D锁存三态
输出电路
1
8
1
10
40
21
80C31
单片微型计算机
1
20
Ⅲ
稳压
电源
14
8
CD4069
六反相器
1
7
14
8
16
9
CD4013
双上升沿
D触发器
CD4060
14位二进制
串行计数器
1
7
1
8
Ⅳ
秒信号发生及时钟控制
14
8
CD4081
四2输入与门
1
7
14
8
16
9
74HC74
双D-K
触发器
CD4098
双单稳
触发器
1
7
1
8
语音报时及外接电器控制

图 3

Automatic control Apparatus for Charging and Discharging Battery

The present utility model relates to an electronic automatic control apparatus, and particularly to an apparatus adapted for charging and discharging battery.

Conventionally, terminating states of the charging and discharging of a battery can be determined by methods of measurement of the voltage, specific gravity of the electrolyte, accumulated capacity variations of the battery or the like, however, these methods are rather inconvenient in actual use, especially when they are used frequently. Therefore, the actual charging and discharging times are conventionally used as the basis of terminating determination, for example, the traditional charging time of 24 hours is always used as a criterion for the batteries used in vehicles and battery-driven cars. While this method is convenient and operable, it is difficult for the user to control the battery to work in its optimal operation state, and it may cause the battery to be overcharged or undercharged/overdischarged. The overcharge of the battery both wastes electrical power and possibly damages the electrode plates; and undercharge may reduce the capacity of the battery; while overdischarge also affects the life of the battery.

The object of the present utility model is to provide an electronic automatic control apparatus capable of controlling the charging and discharging level of a battery, so as to ensure the battery to work in its optimal operation state.

The present utility model is implemented by: automatically controlling the charging and discharging level of the battery by the use of an electronic circuit based on the saturate inflexion point of changing of the characteristic curve of charging and discharging of the battery and the voltage

characteristic at the termination of discharging. The electronic control circuit mainly comprises two major portions of a charging automatic control circuit and a discharging automatic control circuit. Each of the control circuits comprises a voltage sampling circuit, an electronic amplifying circuit, a state maintaining and memory circuit, an execution mechanism, and etc. Discrete components and integrated circuits can both be used as the electronic devices thereof. Relays can be used as the execution mechanism thereof. When performing charging operation, the voltage sampling circuit operates to track the voltage across the electrode plates of the battery, when the voltage of the battery is charged to the value of the saturate inflexion point (higher than 32-35% of the nominal voltage of the battery), the sampling circuit drives the amplifying circuit to work, resulting in cutting off the charging power supply by the execution mechanism, and the charging operation being stopped. At this time, the state maintaining and memory circuit ensures the amplifying circuit to operate continuously, while the charging voltage sampling circuit does not function; therefore, the charging operation will not by repeated even if the terminal voltage of the battery is reduced to lower than the voltage of the saturate inflexion point immediately, Similarly, in the discharging state, when the working voltage of the battery is reduced to its terminating voltage (lower than 12%-15% of the nominal voltage), the sampling and amplifying circuit drives the execution mechanism to cut off the output circuit to stop power supply. At this time, the state maintaining and memory circuit ensures the amplifying circuit to operate continuously and the discharging voltage sampling circuit does not function; therefore, the discharging operation will not be repeated even if the terminal voltage rises again immediately after the battery stops discharging. In addition, sound alarm and light state indicator can be provided on the present utility model, respectively or simultaneously, so as to reflect the instant operation state of the battery intuitively and accurately.

The present utility model has the function of automatically and accurately controlling the charging and discharging level of the battery, it is

convenient, safe and reliable to use, as well as capable of ensuring the battery to operate in its optimal state, and it is advantageous to save electric energy and to prolong the life of the battery; the circuitry structure is relatively simple, and the cost thereof is low whether discrete components or integrated circuits are used; the applicability thereof is wide, the present control apparatus can be used to automatically control the charging and discharging of lead battery whether the capacity thereof is large or small and the nominal voltage thereof is high or low ,it can be controlled to operate in its optimal state, the present utility model can be used in any situations where the lead batteries are employed as power sources, including the situations of inverting power supply and DC power supply.

Embodiments of the present utility model as shown in the Figures will be explained in detail with reference to the accompanying drawings.

Fig. 1 is a circuitry diagram of the present utility model; and
Fig. 2 is a schematic diagram of the structure of the present utility model.

Referring to Fig. 1, The control apparatus mainly comprises a housing (1), a front panel (2), and a circuit board (3). A switch K1 for manually controlling the battery, a DC discharging switch K2, a charging state indicator, LD1, a fully charged indicator LD2, a fully discharged indicator LD3, an AC power supply plug JW1, a battery connecting socket TW2 and a DC discharging output socket JW3 are provided on the front panel (2). All other electronic elements than those mounted on the front panel (2) are mounted on the circuit board (3), as shown in Fig. 2.

Referring to Fig. 2, the circuit is mainly constituted by two major portions of a charging automatic control circuit (4) and a discharging automatic control circuit (5).

The charging automatic control circuit mainly comprises: an AC power

supply circuit including an AC power supply plug JW1, an AC power supply transformer T and a current-limiting resistor R; a charging state display circuit including a rectifying diode D2, a resistor R4 and a light emitting diode LD1; a charging circuit including a rectifying diode D1, a normal close contact J1-1 a battery switch K1 and a battery connection socket JW2; a charging voltage sampling circuit including a stabilivolt tube DW1 and resistors R1 and R2; an electronic amplifying circuit including a triode BG1 and a resistor R11; a stopping charging execution mechanism including a relay J1, a normal close contact J1-1 and a capacitor C1; a stopping charging state maintaining and memory circuit including resistors R8 and R3, a capacitor C4, a relay J1 and a normal open contact J1-2; and a fully charged state display circuit including a light emitting diode LD2 and a resistor R5.

The discharging automatic control circuit mainly comprises: a battery discharging voltage sampling circuit including a stabilivolt tube DW2, resistors R6 and R7; an amplifying and state maintaining and memory circuit including triodes BG2, BG3 and BG4, resistors R8, R13, R14, R15 and R16; a discharging circuit including a normal open contact J2-2, a discharging switch K2, and a DC discharging output socket JW3; a stopping discharging execution mechanism including a relay J2, a normal open contact J2-2 and a capacitor C3; and a fully discharged sate display circuit including a normal close contact J2-1, a light emitting diode LD3 and a resistor R10.

When performing charging operation, insert the AC power supply plug JW1, and the light emitting diode LD1 lights to indicate the connection to the power supply; close the battery switch K1 and start the charging operation of the battery. When the battery is charged to a voltage higher than 32-35% of the nominal voltage (i.e. saturate inflexion point voltage) of the battery, the sampled voltage at point A which is rising with the charging turns on BG1; J1 starts to operate, and J1-1 is disconnected to cutoff the charging

power supply; LD2 light to indicate that the battery has been fully charged; J1-2 is closed to keep BG1 turning on, and the voltage sampling circuit does not function to maintaining the circuit in the state of stopping charging. When performing discharging operation, insert the load plug into the socket JW3, and turn on the discharging switch K2, then the battery performs normal discharging operation as a DC power supply, at this time, BG4 is turned on, I2 operates, J2-1 is turned off, J2-2 is closed, and the circuit outputs current. When the battery discharges to a voltage lower than 12-15% of the nominal voltage (terminating voltage), the lowering of the voltage sampled at point B turns off BG2, turns on BG3 and turns off BG4 to stop the operation of J2, J2-2 is turned off to cut off the load circuit to stop discharging operation; J2-1 is closed and LD3 lights to indicate that the battery has been fully discharged, or that the battery shall be re-charged for further use.

Claims

1. An automatic control apparatus for charging and discharging battery, comprising a housing (1), a front panel (2) and a circuit board (3), characterized in that the electronic circuit comprises a charging automatic control circuit (4) and a discharging automatic control circuit (5):

a) said charging automatic control circuit (4) comprising a charging voltage sampling circuit (DW1, R1,R2), an electronic amplifying circuit (BG1,R11), a stopping charging state maintaining and memory circuit (R9, R3< C4, J1,J1-2), a stopping charging execution mechanism (CJ1, J1-1, C1) and a state display circuit (LD2, R5);

b) said discharging automatic control circuit (5) comprising a discharging voltage sampling circuit (DW2, R6, R7), and electronic amplifying and discharging state maintaining and memory circuit (BG2, BG3, BG4, R8, R13. R14, R15, R16), a stopping discharging execution mechanism (J2, J2-2, C3), and a state display circuit (LD3, R10).

2. The automatic control apparatus for charging and discharging battery according to claim 1, characterized in that the charging saturate inflexion point voltage is higher than 32-35% of the nominal voltage of the battery.

3. The automatic control apparatus for charging and discharging battery, characterized in that the discharging terminating voltage is lower than 12-15% of the nominal voltage of the battery.

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Abstract

10 The present utility model discloses an automatic control apparatus for charging and discharging battery, which mainly comprises a voltage sampling circuit, an electronic amplifying circuit, a state maintaining and memory circuit, an execution mechanism, a state display and etc. It is characterized in that the charging and discharging levels of the battery are 15 automatically controlled by the electronic circuits, the occurrences of overcharging, undercharging or overdischarging of the battery can be effectively avoided, the optimal state of the battery can be ensured, and it is advantageous for saving electric power and prolonging the life of the battery.

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